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DIC Corporation

**DIC Receives Incentive Award in the 17th GSC Awards for
Development of Sheet-Form Heat Storage Material**
—High marks given balance of heat storage ability and workability—

Tokyo, Japan—DIC Corporation announced today that it has received an Incentive Award in the 17th Green Sustainable Chemistry (GSC) Awards, conferred by the Japan Association for Chemical Innovation (JACI), for its development of a sheet-form heat storage material. JACI defines GSC as chemistry that is both human- and environment-friendly and contributes to sustainability and in 2001 established the GSC Awards program to recognize individuals and organizations for outstanding achievements in this field. The program comprises the Minister of Education Award, the Minister of Economy, Trade and Industry Award, the Minister of the Environment Award, the Small Business Award and the Incentive Award. The Incentive Award acknowledges achievements exhibiting promise for future deployment.

Phase change materials (PCMs), which utilize the thermal properties of phase change—the process of changing from liquid to solid and vice-versa—liquefy at a certain temperature above melting point. PCMs laminated together with other materials have long been used in construction, but difficulties in altering size and poor workability have prompted housing builders and general contractors to call for the development of new materials.

Leveraging its proprietary coating and compounding technologies, DIC developed a technology for the uniformly dispersing PCMs into resin with no degradation of properties to create a thick film, thereby preventing the materials from oozing and leaking during phase change. In addition to a performance comparable to that of PCMs in laminated packages, the resulting sheet-form heat storage material can be cut, bent and fastened into place with screws on-site. DIC's sheet-form heat storage material can also be laminated together with a variety of other materials such as plasterboard and flooring, expanding options for use in houses and other buildings and facilitating use in walls and ceilings, which is difficult with conventional products.

DIC verified the effectiveness of its new sheet-form heat storage material through testing on seven houses as part of the Technology Development of Solar Thermal Energy Utilization Houses project, organized by the New Energy and Industrial Technology Development Organization (NEDO). Testing verified that when used together with a solar air heating system, the material absorbs solar heat during the day and releases it at night when the ambient temperature has dropped, the material helps to mitigate nighttime declines in room temperature and reduce energy required for heating. A proposal for use of the material by a housing builder that collaborated with DIC to conduct verification testing was selected by Japan's Ministry of Land, Infrastructure, Transport and Tourism as a leading sustainable buildings project. Moreover, thanks to the

efforts of the Heat Storage Building Materials Consortium, in which DIC is a participant and which is tasked with standardization, in March 2018 a JTCCM Standard of Testing Methods (JSTM) standard was established for the method used to measure the performance of heat storage building materials. Created by the Japan Testing Center for Construction Materials (JTCCM), JSTM standards are quality assurance standards for materials and items used in the construction sector. The consortium is currently aiming for the development of a Japan Industrial Standards (JIS) standard for this material in 2021.

DIC will continue working to establish its new sheet-form heat storage material as an insulating material for construction applications that will help reduce society's overall consumption of energy. The Company is also testing the effectiveness of the material in minimizing temperature variations when attached to the inside of containers used in constant-temperature transportation and in increasing crop yields and sugar content when used in the cultivation of tomatoes and strawberries. In addition, DIC is endeavoring to realize weight reduction for this material to encourage wider adoption, including in electric vehicles, to reduce the energy requirements of air conditioning systems.

Going forward, DIC will promote the cultivation of new applications for its sheet-form heat storage material in a wide range of industries. Through these efforts, the Company will seek to contribute to the further advancement of GSC.

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Related news release:

DIC Develops Sheet-Form Passive Heat Storage Material to Effectively Harness Solar Heat
(July 11, 2017)

http://www.dic-global.com/en/release/2017/20170711_01.html